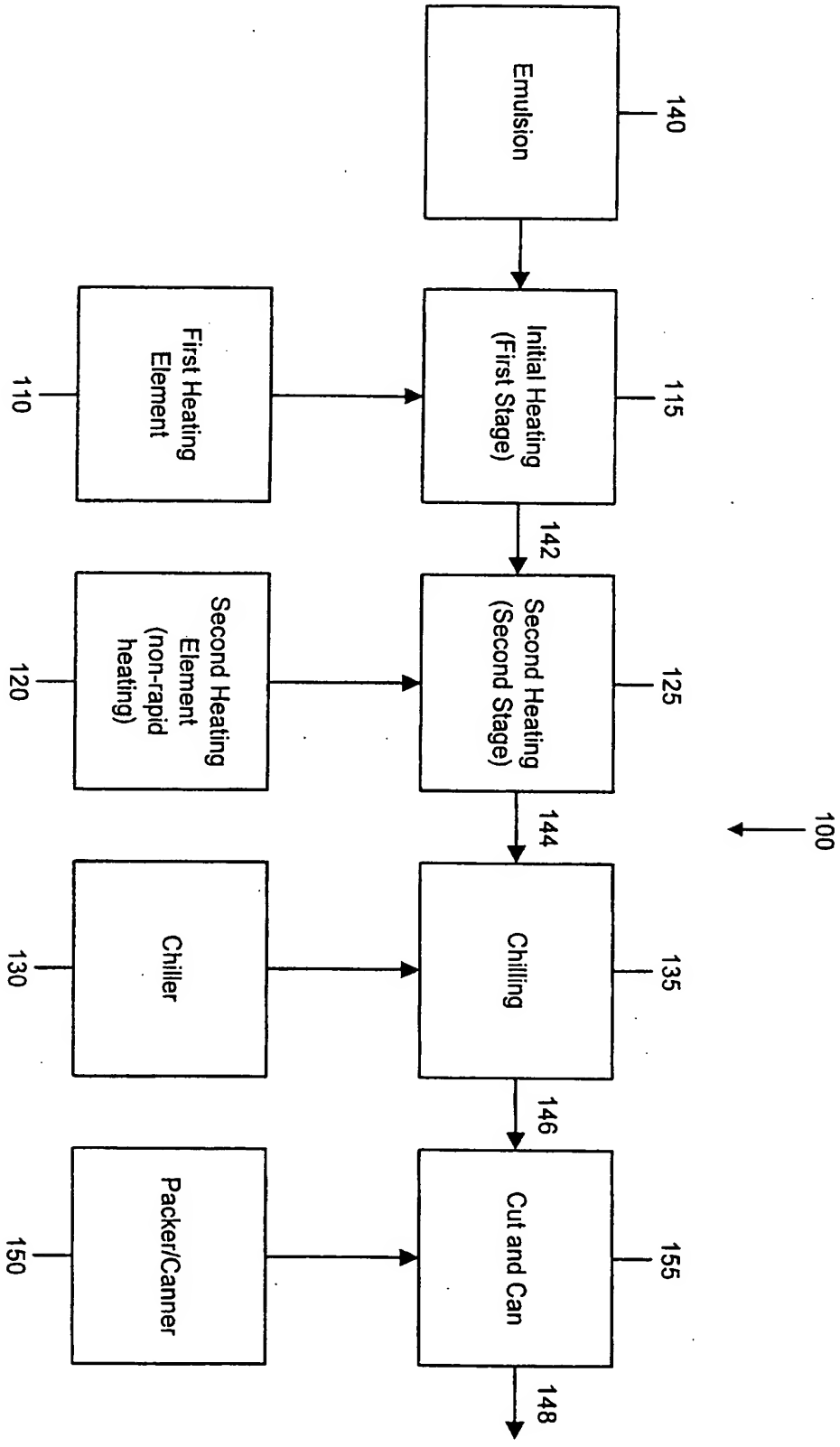
Emulsion
140
First Heating Element
110
Initial Heating (First Stage)
115
142
Second Heating Element (non-rapid heating)
120
Second Heating (Second Stage)
125
144
100
Chiller
130
Chilling
135
146
Packer/Canner
150
Cut and Can
155
148

Fig. 1

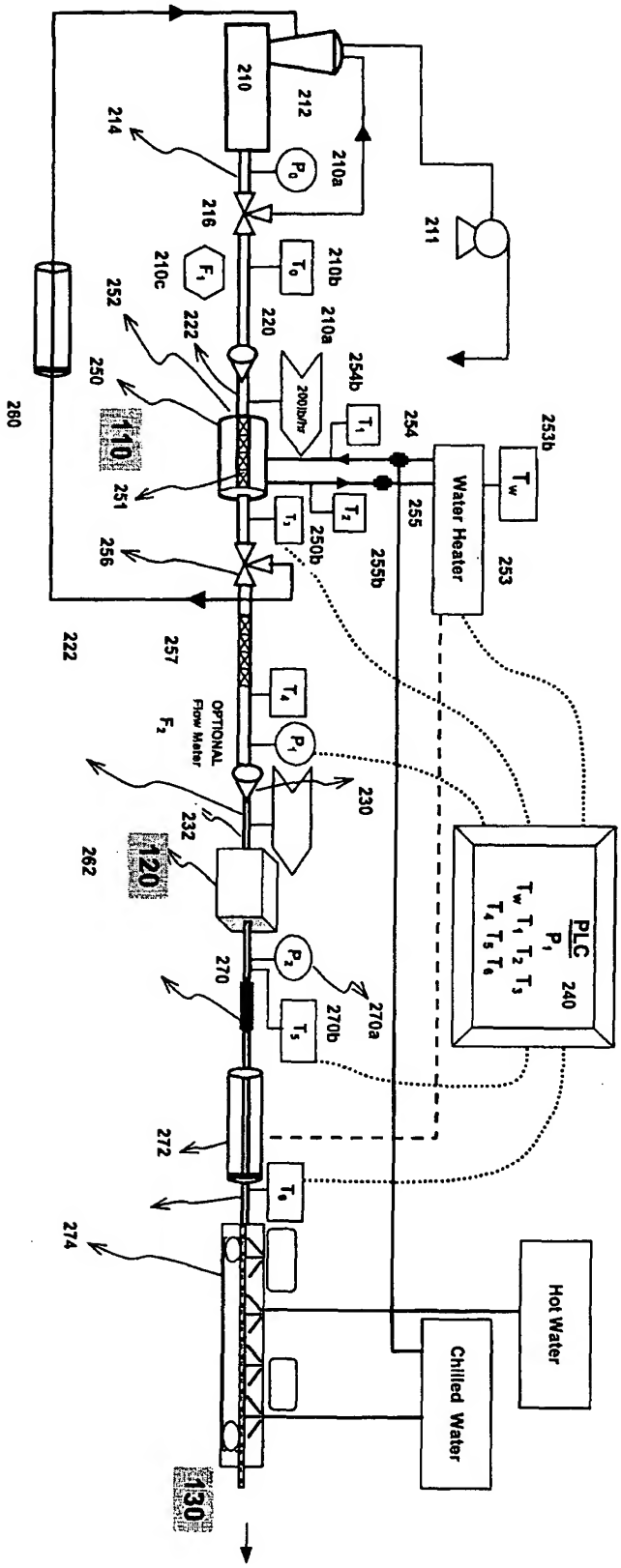
210
212
214
210a
P_0
216
211
T_0
F_1
210b
210c
252
222
220
210a
254b
250
200lb/hr
T_1
254
253b
T_w
Water Heater
110
251
T_2
255
T_3
250b
255b
253
256
222
257
T_4
P_1
OPTIONAL
Flow Meter
F_2
230
232
120
262
PLC
P_1
T_w T_1 T_2 T_3
T_4 T_5 T_6
240
270
P_2
270a
270b
T_5
272
T_6
274
Hot Water
Chilled Water
130
280

FIG. 2

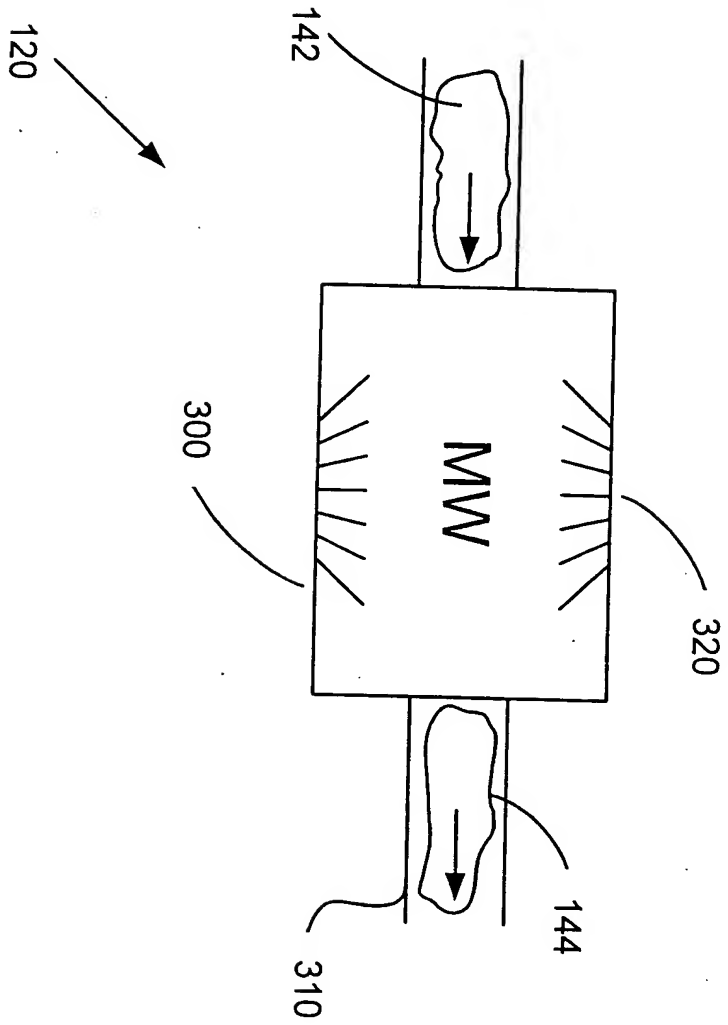

Fig. 3

* Represents continuous heating of emulsion from 40 degrees F to 160 degrees F without using dual stage heating

Large-Scale System

Assuming "X" Pounds of Meat Emulsion, Quantity of Power Required to Prepare Casingless Sausage With a Processing Line					
Meat Emulsion (lbs) to Process Per Hour	Emulsion Temperature		Sausage Temperature	Power Required (MW)	**Reduction In Power (MW) Using Dual Stage Heating**
	FIRST TEMPERATURE AND INITIAL HEATING		SECOND / FINAL HEATING		
	First Temperature (F) (Prior to Pre-heating)	Initial Heating Temperature (F) (First Stage)	Second Heating Temperature (F) (Second Stage)		
15,000	40 (First)*		160 (Final)*	422*	
15,000		50	160	387	**35**
15,000		60	160	352	**70**
15,000		70	160	317	**106**
15,000		80	160	282	**141**
15,000		90	160	246	**176**
15,000		100	160	211	**211**

Small-Scale System

Assuming "X" Pounds of Meat Emulsion, Quantity of Power Required to Prepare Casingless Sausage With a Processing Line					
Meat Emulsion (lbs) to Process Per Hour	Emulsion Temperature		Sausage Temperature	Power Required (MW)	**Reduction In Power (MW) Using Dual Stage Heating**
	FIRST TEMPERATURE AND INITIAL HEATING		SECOND / FINAL HEATING		
	First Temperature (F) (Prior to Pre-heating)	Initial Heating Temperature (F) (First Stage)	Second Heating Temperature (F) (Second Stage)		
200	40 (First)*		160 (Final)*	6*	
200		50	160	5	**1**
200		60	160	5	**1**
200		70	160	4	**2**
200		80	160	4	**2**
200		90	160	3	**3**
200		100	160	3	**3**

Fig. 4

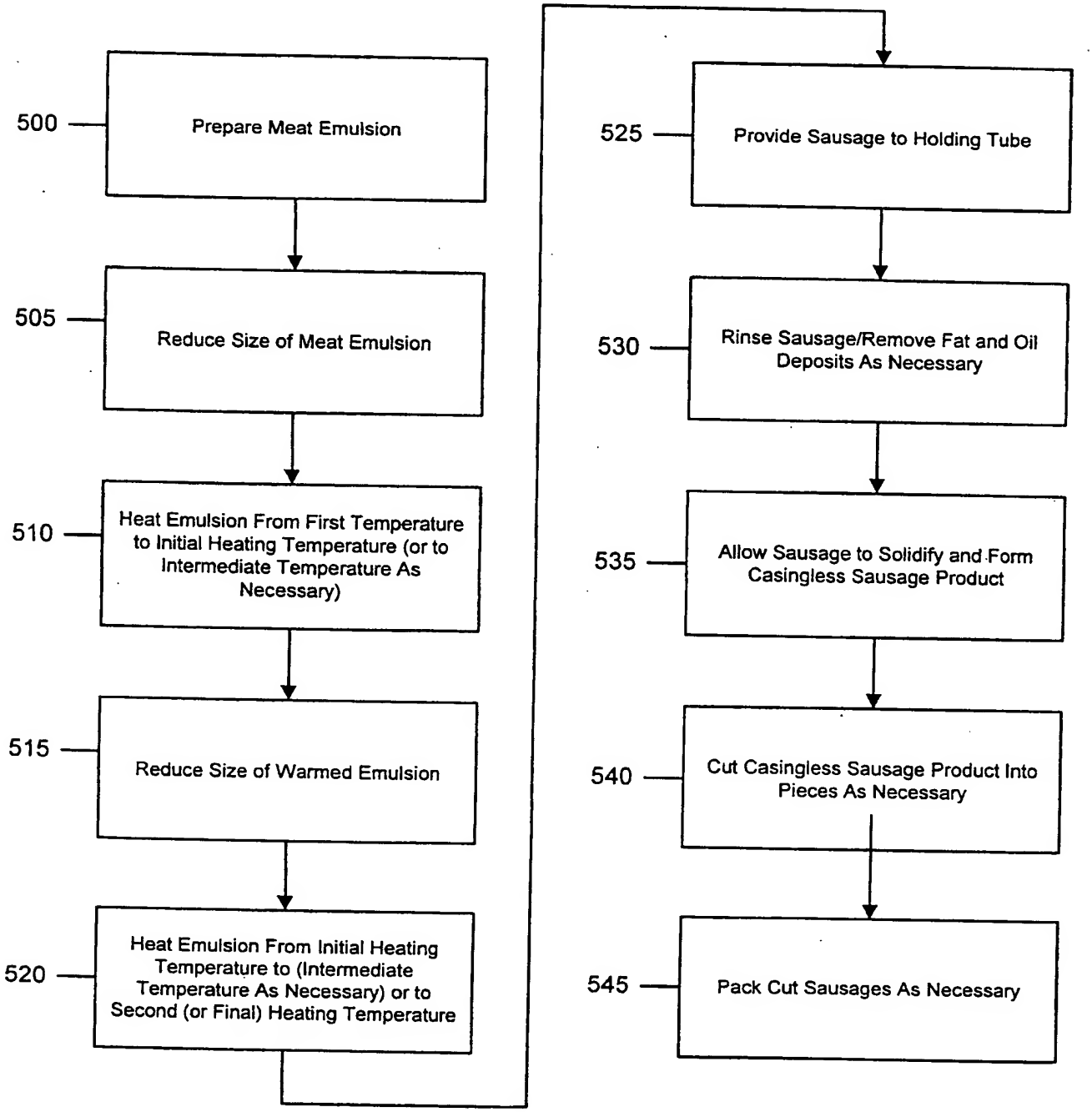
500
Prepare Meat Emulsion
505
Reduce Size of Meat Emulsion
510
Heat Emulsion From First Temperature to Initial Heating Temperature (or to Intermediate Temperature As Necessary)
515
Reduce Size of Warmed Emulsion
520
Heat Emulsion From Initial Heating Temperature to (Intermediate Temperature As Necessary) or to Second (or Final) Heating Temperature
525
Provide Sausage to Holding Tube
530
Rinse Sausage/Remove Fat and Oil Deposits As Necessary
535
Allow Sausage to Solidify and Form Casingless Sausage Product
540
Cut Casingless Sausage Product Into Pieces As Necessary
545
Pack Cut Sausages As Necessary

Fig. 5